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Labor Productivity of Services Sector in Malaysia: Analysis Using Input-Output Approach

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Abstract

Productivity reflects the ability of an organization or country to generate higher income or value-added. As Malaysia is taking a rigorous step to become an advanced country with high-income status by 2020, it is crucial to have high productivity in the production processes. Due to the high share of the transportation, communication and financial sub-sectors to the overall economy, they are considered as the stimulants to the overall growth. This paper attempts to determine the labor productivity of these three sub-sectors using the input-output analysis approach. The methodological setting is the utilization of the “labor coefficients” calculated from input-output tables of Malaysia for the years 2000 and 2005 as well as through surveys of related sub-sectors in 2012.

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1. Introduction

In general, sector contribution to the economy is estimated by measures such as shares in gross domestic product (GDP) and employment. Data from Economic Report of 2010 revealed that the main contributor to the Malaysian GDP no longer originates from agriculture, manufacturing or any other sector but actually, it originates from the services sector. In 2008, for instance, the sector had accounted for 55.0 per cent of GDP and 52.2 per cent of total employment, while in 2010, the sector contribution to GDP was even higher, i.e at 58.5 per cent (see Economic Report Malaysia, 2010).

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Table 1. Share of the gross domestic product by sectors in Malaysia 2008-2010

Sectors	Share of GDP (%)		
	2008	2009	2010
Agriculture	7.5	7.6	7.6
Mining	8.1	8.1	7.9
Manufacturing	29.1	26.4	26.2
Construction	3.0	3.2	3.2
Services	55.0	57.9	58.5
Less: FISIM	3.9	4.3	4.5
Add: Imports	1.3	1.2	1.1
GDP	100.0	100.0	100.0

*Source: Economic Report Malaysia, 2010.

Table 1 above shows the contributions of all sectors to the GDP in Malaysia from 2008 to 2010. The table depicts that agricultural contribution to the GDP was almost flat at around 7.6 per cent in 2009 and 2010, while in manufacturing sector the contribution decreased from 29.2 per cent in 2008 to 26.2 per cent in 2010. However, as mentioned earlier, the service sector contributed more than twice to the GDP (58.5 per cent) as compared to manufacturing in 2010. This signifies the importance of service sector in enhancing economic growth in Malaysia beyond 2010.

2. Performance of Service Sub-sectors

The performance of the various service sub-sectors for the years 2008 and 2010 can be shown as in Table 2 below.

Table 2. Service sub-sectors and share of GDP in 2008 and 2010.

Sectors	Change (%)		Share of GDP (%)	
	2008	2010	2008	2010
Intermediate Services:				
Transport & storage	6.1	2.1	3.8	3.8
Communication	7.3	6.6	3.9	4.4
Finance and insurance	7.7	4.0	11.0	11.8
Real estate and business	1.5	3.1	5.1	5.4
Final Services:				
Utilities	2.1	1.8	2.9	2.9
Wholesale and retail	9.8	3.5	12.8	13.5
Accomm. & Restaurants	7.3	3.1	2.4	2.6
Other Services	5.2	5.0	5.7	6.3
Government Services	11.1	2.8	7.4	7.8
Total	7.2	3.6	55.0	58.5

*Sources: Department of Statistics (DOSM), Malaysia 2010, 2011.

From table 2, it reveals that for the year 2008 high growth were seen in government services (11.1 per cent) followed by wholesale and retail trade (9.8 per cent) and finance and insurance services (7.7 per cent). On the other hand, in 2010 prominent growth were seen in telecommunication (6.6 per cent), other services (5 per cent) and finance and insurance (4 per cent) sub-sectors, although the rate of growth was not as high compared to 2008.

In terms of percentage contribution to the GDP the highest share was shown in wholesale and retail trade (12.8 per cent) and finance and insurance (11 per cent) in 2008. The same two sub-sectors showed the highest

share to the GDP with the former showed 13.5 per cent and the later showed 11.8 per cent share. However, if we look at the three sub-sectors of transport, communication and finance, the respective share to the GDP were 3.8 per cent, 3.9 per cent and 11 per cent in 2008, making a total of 18.7 per cent share to the GDP. The total share to the GDP of the same three subsectors in 2010 increased to 20 per cent. All these made up of 34 per cent and 34.2 per cent of the overall services sectors contribution for the two years. Therefore, it is pertinent to pursue the study on the importance of these three subsectors of transportation, telecommunication and financial services sectors in Malaysia.

3. Objective

Malaysia is taking a rigorous step to be an advanced country with high income status by the year 2020, it is useful that the country has high productivity in the production processes of all sectors. Due to the high share of the transportation, communication and the financial sub-sectors to the overall economy, these sub-sectors are regarded as stimulants to the overall growth. Hence, the objective of the study is to determine the growth of productivity of these sub-sectors.

4. Methodology

The methodological approach in this exercise is to use the input-output approach of analysis. This approach shows the relationship between the flows of the various sectors in the economy, whereby the relationship between the producers and the consumers as well as the interdependence among industries can be shown. It can also track the flow of commodity (goods and services) from one industry to another industry. The flow of commodities supplied and used is compiled systematically in the form of input-output table (Ismail, 2007). The input-output tables describe the process of production, the use of goods and services and the way in which income and value-added products are generated within the various sectors of the economy. In essence, the set of producers of similar goods and services forms a homogenous industry (see Jensen, *et al.*, 1986). Through this set of tables during a given time period, the structural change in the economy and the specific sector's economic characteristics can be revealed.

The input-output analysis has many applications, particularly in economic planning. For instance, it offers a static view of the structural relationship among the different sectors in the economy (typically national or regional) for a certain period of time, generally a year. The relationship is expressed purely in monetary terms (Valadkhani, 2003). Other applications of input-output tables are determining the technical capability of production, economic linkages of various sectors as well as comparing the technological standard of one country compared vis-à-vis other countries. Works on such applications can be seen in Sauian, 2007, and Miller, *et al.*, 2009. Similarly, the study of labor productivity of the various sectors of the economy can easily be discovered.

4.1 Productivity Measure

Productivity is generally defined as a measure of physical output produced from a given quantity of inputs. It is a ratio to show how effectively and efficiently a firm or organization turns a set of inputs into a product or service. However, there is various measure of productivity. Some of these include capital productivity, labor productivity, profitability indices and total output productivity. At this juncture, we would only consider labor productivity, which is an important measure to gauge competitiveness in producing goods and services.

Basically, labor productivity, P can simply be defined as:

$$\begin{aligned} P &= (\text{total output})/(\text{total labor input}) \\ &= (\text{total income generated})/(\text{total labor input}) \end{aligned} \quad (1)$$

If the sector of interest is indicated by “ i ” in the economy, then labor productivity can be given by:

$$P_i = (\text{total income generated by industry } i)/(\text{total labor force in industry } i) \quad (2)$$

Many economists and input-output scholars however adopted an alternative measure of labor productivity, i.e labor coefficients (see Mathur, 1979; Sauian, 2002). In retrospect, labor coefficients describe the labor requirement in producing a unit dollar of output. It is defined as follows:

$$l_j = L_j/X_j \quad (3)$$

where l_j is the coefficient of labor requirement for the j^{th} sector output, L_j the labor force employed in sector j and X_j is the gross output of sector j . To avoid too many zeroes in the decimal places, the X_j values can be expressed in thousand Malaysian Ringgit (RM) of output. Thus, the coefficient will describe the labor required to produce RM 1000 of output in a given year.

5. Data Sources

The data used are based on the input- output tables of Malaysia 2000 and 2005 which were published in 2005 and 2010 respectively (see Department of Statistics, Malaysia 2005, 2010. Other sources of data include Economic Report Malaysia 2010, Annual National Accounts: Gross Domestic Product 2000-2010 (Department of Statistics, 2011) and the Economic Transformation Programme: A roadmap for Malaysia 2010 (PEMANDU, Prime Minister’s Department, 2010) and the monthly Statistical Bulletin of Bank Negara Malaysia, 2010 (Bank Negara Malaysia, 2010). Furthermore, a survey was carried out in the three sub-sectors transportation, communication and the finance in 2012 to gauge whether the representative sectors had increased their productivity compared to the national calculation of 2000, 2005 and 2010.

6. Results and Interpretation

6.1 Labor Productivity of Transportation, Communication and Financial Sub-sectors

Using equation (3) of the previous section, we could calculate the labor coefficients of transportation, communication and financial service subsectors as a measure of labor productivity. Table 3 below indicates the labor coefficients of those sectors for the years 2000, 2005 and 2010.

Table 3. Labor coefficients of Transport, Communication and Financial Sectors 2000, 2005 and 2010. (per RM 1000 of output)

Subsectors	Years		
	2000	2005	2010
Land Transport	0.0025	0.0022	0.0048
Water Transport	0.0177	0.0203	0.0051
Air Transport	0.0256	0.0221	0.0067
Operations of Ports and Airport	0.0047	0.0030	0.0021
Other Transport Services	0.0025	0.0339	0.0044
Overall Transportation Services	0.0128	0.0141	0.0042
Communication	0.0872	0.0956	0.0083
Financial Services	0.0194	0.0113	0.0035

Notes: *For 2000, 2005 calculated from I/O Tables Malaysia; for 2010 from DOSM; Services Statistics, 2010.

From Table 3, it reveals that land transport shows decreasing trend of labor coefficients from 0.0025 in 2000, to 0.0022 in 2005 but increased to 0.0048 in 2010. Water transport, however shows an increase in labor coefficients in 2005 (0.0203) compared to year 2000 (0.0177) but decreased again to 0.0051 in 2010. However, air transport and operations of ports and airports shows significant decrease in labor coefficients over the years of 2000, 2005 and 2010. If we look at the overall transportation service sub-sectors, it indicates that labor coefficients shows a decreasing trend from 0.0128 in 2000 to 0.0141 in 2005 and 0.0042 in 2010. This reflects that the labor productivity of the overall transportation sector has increased.

Communication sub-sector also shows a decrease in labor coefficient in 2010 compared to 2005, albeit it increases a bit in 2005 compared to 2000. Financial services subsector (which includes finance and insurance) recorded a decrease in labor coefficients throughout the years 2000, 2005 and 2010. This means that productivity increase throughout these years in financial services sector.

By and large, the trend indicates that labor coefficients had decreased in all the three main sub-sectors of transportation, communications and finance. Hence, labor productivity has actually been increasing.

6.2 Survey Results

As mentioned earlier, a short survey was also carried out on the three sub-sectors of transportation, communication and finance in 2012. A total of 100 questionnaires were distributed to the respective organizations within these three sub-sectors. However, only 40 respondents gave their response. Table 4 below depicts the values of labor coefficients calculated from the results of the survey.

Table 4. Labor Coefficients of Transportation, Communication and Financial Sectors 2012 (per RM1000 unit of output)

Subsectors	Labor coefficient (2012)
Transportation	0.00812
Communications	0.00662
Financial Services	0.00941

Results from the survey conducted in 2012 revealed that the values of labor coefficients from existing industries show the respective coefficients in transportation, communication and financial industries are 0.00812, 0.00662 and 0.0094. The figure for transportation services industries of 0.00812 for 2012 is bigger than the value of the national labor coefficient of transportation sector in 2010. This may be due to increase

labor cost as well as the overhead and capital cost involved in this sector after 2010. This causes drops in profit and thus decreasing the productivity of that sector. However, looking at the communication industry it shows lower value of 0.0066 as compared to 0.0083 in 2010. For the financial sub-sector the survey revealed that the labor coefficients for the industry show a slightly higher value compared to the national coefficients in 2010. Hence, it shows that labor productivity has actually been increasing for the communication subsector for 2012, although there was a drop for both the transportation and financial subsectors.

7. Conclusions

This exercise gives an indication that generally the overall labor coefficients of the three subsectors of transportation, communication and financial services were decreasing from 2000 to 2010. This implies that the labor productivity of the three subsectors had actually been increasing for the years from 2000 to 2010. This happens because the quality of labor has increased due to the increase in skill as well as the usage of ICT (Information and Communication Technology) in the operations of the organizations of these sectors. As these three subsectors generate more than 34 per cent of the GDP of the overall service sectors in 2010, the sectors can be regarded as a mover or stimulant to the economic growth to the nation. Hence, it is important to reemphasize and enhance these subsectors for more developmental purposes. This is due to the fact that other economic sectors including manufacturing are highly dependent on these subsectors, especially in terms of logistics, ICT usage and finance. The many projects implemented under the government ETP program from these subsectors, in essence is a framework to reengineer the economy to become more advanced and reap the high-income status by 2020.

The short survey also indicated the increase in productivity for the 2 years from 2010 to 2012 for the communication sub-sector. This proves the point on the importance of ICT in economic development. Although the survey does not give significant change in productivity for the transportation and financial subsectors, it provides a clue for small and medium industries to be more efficient and effective in managing their operations.

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